Abstract Submitted
for the DPP98 Meeting of
The American Physical Society

Sorting Category: 5.1.1.2 (experiment)

Radiative Discharges Using Argon in DIII–D[1] M.R. WADE, Oak Ridge National Laboratory, AND THE DIII–D DIVERTOR RESEARCH TEAM — Steady-state, radiative plasmas with H–mode confinement have been produced in DIII–D which meet all of the power exhaust-related requirements of the ITER EDA design simultaneously. This work is an extension of previous studies that demonstrated the efficacy of inducing a scrape-off-layer (SOL) flow to preferentially enrich impurities in the divertor plasma. Utilizing simultaneous argon and deuterium injection, these radiative plasmas combine high radiation losses ($P_{\rm rad}/P_{\rm input} > 70\%$), low core fuel dilution ($Z_{\rm eff} < 1.9$), and good core confinement ($\tau_{\rm E} > \tau_{\rm E,ITER93H}$). A key feature of these discharges is the volumetric distribution of radiation with approximately 50% of the radiation coming from the divertor plasma, 30% from the SOL, and 20% from the core plasma. Although these plasmas exhibit significant heat flux reduction and signatures of divertor detachment, spectroscopic signatures of recombination in the divertor plasma are not observed even though large neutral pressures are obtained in the divertor region.

[1]Work supported by U.S. DOE Contracts DE-AC03-89ER51114, DE-AC02-76CH03073, W-7405-ENG-48, and DE-AC04-94AL85000, and Grants DE-FG03-86ER-53266 and DE-FG02-92ER54139.

M.R. Wade
wade@gav.gat.com
Oak Ridge National Laboratory

[X] Prefer Oral Session
[ ] Prefer Poster Session

Special instructions: DIII–D Oral Session II, immediately following Porter

Date submitted: July 21, 1998 Electronic form version 1.3